**Supplementary Data Table 1. Baseline correlations between whole blood EPA and DHA and cognitive test performance a**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | All |  | Girls | Boys |  |
| **EPA** | Estimate b | P EPA | Estimate b | Estimate b | P Sex × EPA |
| *Overall test performance patterns* c | |  |  |  |  |
| School performance | -0.38 (-0.74; -0.02) | 0.037 |  |  | 0.74 |
| Reading comprehension | -0.08 (-0.31; 0.15) | 0.48 |  |  | 0.091 |
| *D2-test of attention* |  |  |  |  |  |
| Concentration performance (items) |  |  | -2.4 (-9.7; 4.8) | 10.9 (2.8; 18.9) | 0.016 |
| Processing speed (items) | 10.3 (-3.2; 23.9) | 0.14 |  |  | 0.13 |
| Total error % |  |  | 1.22 [1.09; 1.35] | 0.74 [0.65; 0.84] | <0.001 |
| Inattention error % |  |  | 1.24 [1.11; 1.39] | 0.79 [0.69; 0.91] | <0.001 |
| Impulsivity error % |  |  | 0.97 [0.68; 1.38] | 0.53 [0.38; 0.75] | 0.017 |
| *Sentence Reading Test* |  |  |  |  |  |
| Reading speed (no. of sentences read) |  |  | 1.19 [1.11; 1.27] | 0.96 [0.89; 1.04] | <0.001 |
| Number correct (sentences) |  |  | 1.22 [1.13; 1.31] | 1.01 [0.94; 1.10] | <0.001 |
| % correct (of read) | 1.54 [1.28; 1.86] | <0.001 |  |  | 0.99 |
| *Math test* |  |  |  |  |  |
| Number correct (sentences) | 1.23 [1.14; 1.32] | <0.001 |  |  | 0.78 |
| **DHA** | Estimate b | P DHA | Estimate b | Estimate b | P Sex × DHA |
| *Overall test performance patterns* c | |  |  |  |  |
| School performance | -0.17 (-0.32; -0.02) | 0.023 |  |  | 0.69 |
| Reading comprehension | 0.01 (-0.08; 0.11) | 0.76 |  |  | 0.96 |
| *D2-test of attention* |  |  |  |  |  |
| Concentration performance (items) | 2.8 (0.5; 5.0) | 0.016 |  |  | 0.74 |
| Processing speed (items) | 7.2 (1.6; 12.8) | 0.011 |  |  | 0.65 |
| Total error % |  |  | 1.03 [0.97; 1.09] | 0.93 [0.89; 0.98] | 0.008 |
| Inattention error % | 1.00 [0.96; 1.04] | 0.92 |  |  | 0.109  0.017 |
| Impulsivity error % |  |  | 0.98 [0.85; 1.14] | 0.79 [0.70; 0.89] |
| *Sentence Reading Test* |  |  |  |  |  |
| Reading speed (no. of sentences read) |  |  | 1.06 [1.03; 1.10] | 1.01 [0.98; 1.04] | 0.008 |
| Number correct (sentences) |  |  | 1.07 [1.04; 1.11] | 1.02 [0.99; 1.05] | 0.021 |
| % correct (of read) | 1.09 [1.03; 1.17] | 0.006 |  |  | 0.34 |
| *Math test* |  |  |  |  |  |
| Number correct (sentences) | 1.07 [1.04; 1.11] | <0.001 |  |  | 0.56 |

w/w%, percentage of total fatty acids.

a Associations were assessed using linear or logistic mixed-effects models including random effects (school, year group (within school), and class) and adjusted for age, sex, grade, household education, month of baseline test, immigrant/descendant, BMI, total physical activity (counts per min) and total fatty acid concentration (μg/100 μL whole blood). Besides this, analyses of outcomes from the d2-test of attention were adjusted for weekday and lesson of test.

b Estimates are presented as β (95 % CI) or OR [95 % CI], as appropriate.

c Test performance patterns were derived from all test outcomes (except from inattention and impulsivity error%) at all available time points using PCA. The two chosen components were named by the most negative variables in the loading plot, i.e. a negative estimate indicates an improvement and a positive estimate indicates a deterioration.